

## BRIEF SUMMARY OF THE INVENTION

[0015] The present invention has been contrived in consideration of these circumstances, and its object is to provide a color cathode ray tube with improved display characteristics, in which an odd of a skirt portion that is produced as a shadow mask is molded can be absorbed to reduce errors in the curved surface shape of the shadow mask.

[0016] In order to achieve the above object, a color cathode ray tube according to an aspect of the invention comprises: a panel having a phosphor screen on the inner surface thereof, the phosphor screen having a plurality of phosphor layers; an electron gun located opposite the phosphor screen and configured to emit electron beams toward the phosphor screen; and a shadow mask located opposite the phosphor screen and having a large number of electron beam passage apertures through which the electron beams are applied to the phosphor layers corresponding thereto, the shadow mask being formed by press molding and including a substantially rectangular mask effective portion in the form of a gently sloped dome having the electron beam passage apertures, and a skirt portion extending from the peripheral edge of the mask effective portion substantially at right angles thereto, the skirt portion having a plurality of apertures arranged to be spaced from one another in a direction parallel to the peripheral edge of the mask effective portion and belt portions defined between the apertures and an extending end edge of the skirt portion and extending along the extending end edge, the belt portions having wrinkles formed along the extending end edge by the press molding.

[0017] A color cathode ray tube according to another aspect of the invention comprises: a panel having a phosphor screen on the inner surface thereof, the phosphor screen having a plurality of phosphor layers; an electron gun located opposite the phosphor screen and configured to emit electron beams toward the phosphor screen; and a shadow mask located opposite the phosphor screen and having a large number of electron beam passage apertures through which the electron beams are applied to the phosphor layers corresponding thereto, the shadow mask being formed by press molding and including a substantially rectangular mask effective portion in the form of a gently sloped dome having the electron beam passage apertures, and a skirt portion extending from the peripheral edge of the mask effective portion substantially at right angles thereto, the skirt portion having a plurality of slit groups arranged to be spaced from one another in a direction parallel to the peripheral edge of the mask effective portion and belt portions defined between the slit groups and an extending end edge of the skirt portion and extending along the extending end edge, each of the slit groups including a plurality of slits extending substantially at right angles to the extending end edge of the skirt portion and arranged at spaces in a direction substantially parallel to the extending end edge, the slits including a central slit, the longest one, and side slits arranged on the opposite sides of the central slit and having lengths reduced stepwise.

[0018] According to this manner, the color cathode ray tube constructed in this manner, the apertures or slit groups can absorb an odd of the skirt portion that is produced as the shadow mask is molded, thereby preventing the skirt portion from being spread by the odd. Thus, the resulting color cathode ray tube enjoys higher accuracy for the curved

surface of the mask effective portion and improved display characteristics. At the same time, the belt portions can maintain the strength of the short side portion and improve the resistance to impact.

[0019] Additional objects and advantages of the invention will be set forth in the description which follows, and in part will be obvious from the description, or may be learned by practice of the invention. The objects and advantages of the invention may be realized and obtained by means of the instrumentalities and combinations particularly pointed out hereinafter.

## BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING

[0020] The accompanying drawings, which are incorporated in and constitute a part of the specification, illustrate the invention, and together with the general description given above and the detailed description of the embodiments given below, serve to explain the principles of the invention.

[0021] FIG. 1 is a plan view, partially in section, showing a color cathode ray tube according to an embodiment of the invention;

[0022] FIG. 2A is a perspective view showing a shadow mask of the color cathode ray tube;

[0023] FIG. 2B is an enlarged side view showing a part of the shadow mask;

[0024] FIG. 3 is a plan view showing a mask blank from which the shadow mask is molded;

[0025] FIG. 4 is a diagram schematically showing the curvature radius of the shadow mask;

[0026] FIG. 5A is a perspective view showing a shadow mask according to a second embodiment of the invention;

[0027] FIG. 5B is an enlarged side view showing a part of the shadow mask shown in FIG. 5A;

[0028] FIG. 6 is a diagram showing the relations between the height of a central slit in each slit group of the shadow mask according to the second embodiment and errors caused as the shadow mask is molded;

[0029] FIG. 7 is a diagram showing the relations between the number of slit groups in each side portion of the skirt portion according to the second embodiment and errors caused as the shadow mask is molded;

[0030] FIG. 8A is a perspective view showing a shadow mask according to a third embodiment of the invention;

[0031] FIG. 8B is an enlarged side view showing a part of the shadow mask shown in FIG. 8A; and

[0032] FIG. 9 is a diagram showing the relation between the variation of the aperture width in each side portion of a short side portion according to the third embodiment and the width of each belt portion.

## DETAILED DESCRIPTION OF THE INVENTION

[0033] An in-line color cathode ray tube according to an embodiment of the invention will now be described with reference to the accompanying drawings.